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ABSTRACT

A questionnaire was distributed to 56 individuals (28 heterosexual cohabiting couples, both married and unmarried) to test a nine-axiom theoretical system designed to explain and predict dyadic communication behavior and satisfaction levels in personal phase relationships. Questions were asked to measure such factors as the following: time spent in communication daily, the degree of intimacy experienced, the number of surprises in the relationship per week, the degree of "liking" felt for the partner and the estimation of the partner's liking in return, and levels of satisfaction for each year of cohabitation. The theory is derived from Berger and Calabrese's model of initial interaction and is based on attributional uncertainty reduction, used here to refer to interactants' levels of confidence in their own ability to retroactively explain and proactively predict their partner's behavior. Data support eight of the nine axiom-specified hypotheses. Tables and graphs are included. (Author/DF)

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Beyond Initial Interaction:

DYADIC COMMUNICATION BEHAVIOR AND UNCERTAINTY REDUCTION IN PERSONAL PHASE RELATIONSHIPS

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Beyond Initial Interaction:

DYADIC COMMUNICATION BEHAVIOR AND UNCERTAINTY REDUCTION

IN PERSONAL PHASE RELATIONSHIPS

Historically, most theories dealing with commonly occuring communication situations, where relationship formation activities and decisions are central concerns, have been generated in large part by behavioral scientists in fields other than communication. Notably, social psychology has produced social penetration theory (Altman & Taylor, 1973), Byrne's attraction paradigm (1971), balance theory (Heider, 1958), attribution theory (Kelley, 1973), contingency models of dyadic interaction (Jones & Gerard, 1967), and a host of other theories which constitute the bulk of the literature dealing with dyadic relationship formation and development. While these models do carry important ramifications for the study of dyadic communication behavior, few of them approach phenomena from a communications perspective or employ communication-relevant constructs.

Happily, Berger and Calabrese's (1975) model of initial interaction ("Some explorations in initial interaction and beyond: toward a developmental theory of interpersonal communication") signals a movement toward utilization of more communication-relevant constructs in the description and explanation of dyadic behavior. The utility of this initial interaction model is, however, severely restricted by temporal boundaries placed on the theory by the authors. Although they speculate as to the three-phase nature of social interactions (entry, personal, and exit phases), they defer to some other treatise any extended explication of the latter two phases, choosing instead to limit their concerns to

the entry phase of relationship formation and focus specifically on initial interaction situations. Hence, it shall be the intention of this paper to: set forth some modifications of some of the theoretical constructs employed by Berger and Calabrese; and add a body of propositions designed to extend the model into the second, or personal phase of dyadic relationships.

Uncertainty is employed by Berger and Calabrese (1975) to mean the degree of confidence an individual feels about his own ability to explain retroactively or predict proactively a co-interactant's behavior. Enlarging on this meaning, we can draw on the propositions of information theory (Shannon & Weaver, 1949) which argue that amount of uncertainty exists in opposition to information as a function of the ratio of the number of alternatives of any situational question to the amount of information available. In attempting to enrich the framework within which our understanding of uncertainty exists, we can further enlist the work of later attributionists (Kelley, 1967), emphasizing their general view that persons strive to develop causal structures to provide explanations for their own and others' behavior, as well as predictions about the future behavior of both.

An observation offered by Berger and Calabrese crucial to our considerations is the notion that, while attribution theorists posit such predictions and explanations generally yield imperfect knowledge of ourselves and others, it is nonetheless this imperfect knowledge which guides our behavior. Thus, for our purposes, uncertainty can be viewed as reflective of the relative certainty or uncertainty an individual feels about the predictions and explanations he is able to generate about the behavior of others or himself, without direct dependence upon the accuracy of these predictions. Combining this behavioral view of

uncertainty with information theory's pairing of information and uncertainty, we may derive a perspective of uncertainty viewed as a continuum, ranging from absolute uncertainty, where there is a perceived equal probability of the correctness of any of a set of theoretically infinite alternative retroactive attributional explanations and proactive predictions of behavior, to complete uncertainty reduction, or absolute confidence in one of the set of alternatives.

Berger and Calabrese's (1975) theory of initial interaction sets forth a body of propositions specifying the relationships between eight constructs: seven peripheral input and output constructs are each related to the central construct of uncertainty in seven axioms; and each of the seven peripheral constructs is then placed in a relationship with every other construct in twenty-seven theorems logically deduced from the relationships posited in the axioms. Figure I presents a schematic illustration of the seven axiomatic relationships proposed by Berger and Calabrese.

Figure I about here

Since communication can most accurately be regarded as a process rather than a single static act, we can expect that there will be a continual interaction between the various inputs and outputs of the construct uncertainty level, such that there will emerge a constantly changing level of uncertainty that any interactant will feel toward another interactant. Incorporating our earlier conclusion that uncertainty levels exist as a continuum with high uncertainty at the positive end, and complete uncertainty reduction at the low end of

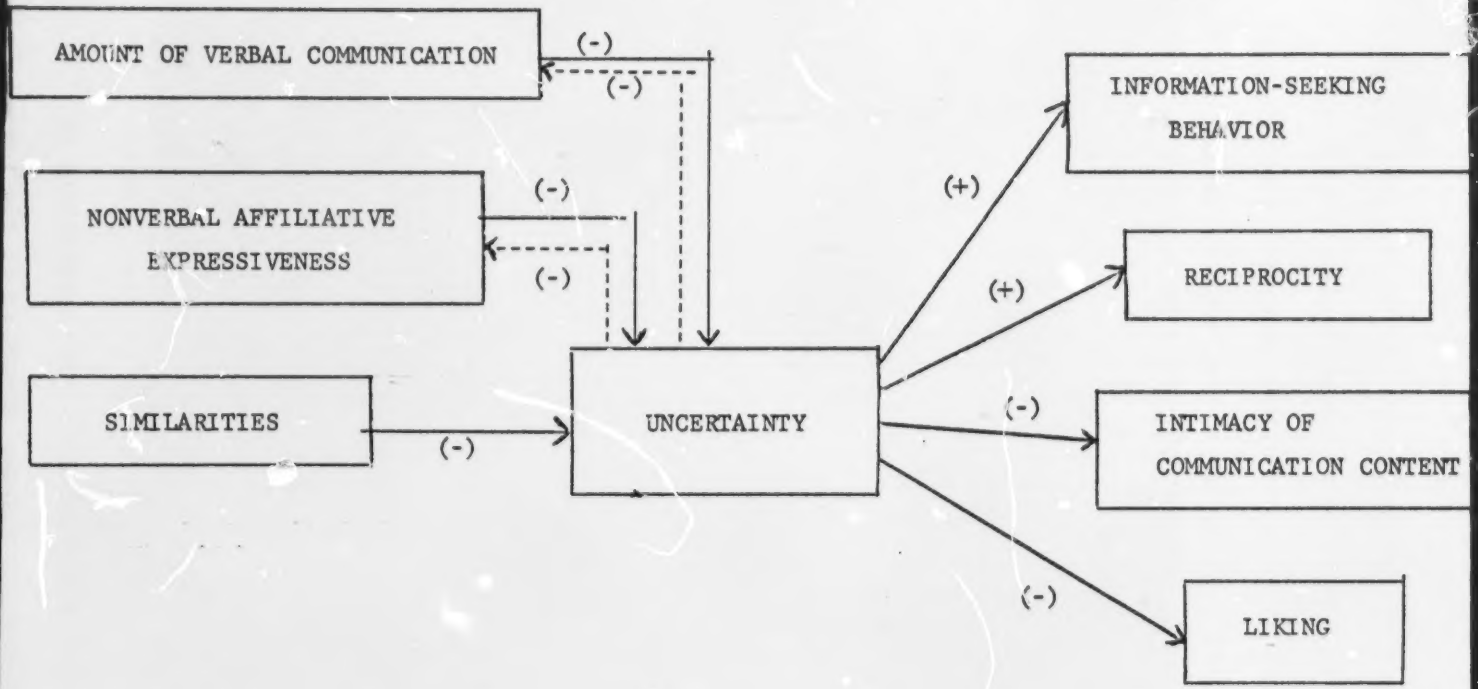
AMOUNT OF VERBAL COMMUNICATION
(-)
(-)
NONVERBAL AFFILIATIVE EXPRESSIVENESS
(-)
(-)
SIMILARITIES
(-)
UNCERTAINTY
(+)
(+)
(-)
(-)
INFORMATION-SEEKING BEHAVIOR
RECIPROCITY
INTIMACY OF COMMUNICATION CONTENT
LIKING

Figure I.

the scale, we can describe a region along this continuum constituting an optimal level of predictive and explanatory ability. Berger and Calabrese imply the possibility of such a tolerance zone as a refutation of the argument that a cost/reward mechanism might subsume the concept of uncertainty, noting that complete predictive and explanatory powers may, contrary to the supposition of reward, lead to utter boredom. From this hypothetical case, and research cited by Berger and Calabrese as evidence of interactant' attempts to reduce uncertainty (Frankfurt, 1965), we may speculate that an optimal level of predictive/explanatory ability lies somewhere along the negative end of the uncertainty continuum toward uncertaintyy reduction, although the exact limits of an optimal zone will probably vary with individuals as idiosyncratic artifacts of personal attributes (cognitive complexity, etc.) and interpersonal situations and experiences.

We can embed these speculations within the framework of a cybernetic view of human interaction, supposing that over the course of a series of interactions, an individual may constantly be evaluating his level of uncertainty, and take steps to act according to the position in which he finds himself relative to his own zone of uncertainty tolerance. That is, an individual who finds that his level of uncertainty about another is uncomfortably high, may engage in information seeking behavior or increase the amount of his verbal communication in an attempt to secure a reciprocal result from the other interactant, thus attempting to reduce his own level of uncertainty. Another alternative action is available to the interactant to reduce his uncertainty; one interactant or both may make the decision to exit from the interaction or relationship, insofar as situational constraints permit. Similarly, the

decision to interact again, thus promoting the maintenance or acceleration of a relationship, is an option continually available to an interactant. Through time, and repeated inputs into and outputs from the level of uncertainty, an individual will make a decision to or not to interact again. Thus we can argue that once an individual of his own volition makes a decision to interact with someone again, he has crossed a subtle boundary from the entry phase to the personal phase.

Maintaining this process view of ongoing decision-making activity, vis-a-vis the choice of whether or not to continue or accelerate a relationship by interacting again, it can be argued that the effects of uncertainty postulated by Berger and Calabrese will not diminish significantly over time. Hence, we can propose a theory, resembling very closely the system specified by Berger and Calabrese, centered around the construct of uncertainty, but capable of explanation and prediction of communicative and affective behavior throughout an entire relationship, rather than during a single encounter or acquaintance set of interactions. Beyond this removal of the temporal boundaries Berger and Calabrese place on their system, some changes in the importance of certain constructs over time, and the added predictive power of interactants' satisfaction with their relationships, there is little necessity for significant alteration of the original model.

Exclusive of its specificity to initial interaction situations and the blanket assumption of universally high initial levels of uncertainty (situational information or other antecedent conditions such as affiliative need may impact initial levels of uncertainty), Axiom #1 can be transferred directly from the initial interaction theory to the personal phase theory, such that:

AXIOM #1: As the amount of verbal communication between interactants increases, the level of uncertainty for each interactant in the relationship will be decreased. As uncertainty is further reduced, the amount of verbal communication will increase.

In fact, the communication behaviors reported by Lalljee & Cook (1973) and Berger & Larimer (1974) bearing on the reciprocal effects of uncertainty upon verbal communication may be dramatically emphasized over time. That is, the reciprocal nature of the effects specified in Axiom #1 suggest the probability of a cyclical chain of events, such that we might imagine a situation where:

Lo verbal comm -> hi uncert -> lo verbal comm -> hi uncert -> lo verb comm

The onset of this chain of events may signal approaching exit from a relationship, as the continually dropping level of verbal communication would almost certaintly soon be reduced to nearly zero, except in situations where exit is otherwise constrained.

Berger and Calabrese's second axiom, which posits a similar type of reciprocal negative causal relationship between nonverbal expressions of affiliation and uncertainty, can also be grafted in tact onto the personal phase model, such that:

AXIOM #2: As nonverbal affiliative expressiveness increases, uncertainty levels will decrease for both interactants in a relationship. In addition, decreases in uncertainty level will cause increases in nonverbal affiliative expressiveness.

Berger and Calabrese's third axiom, which stipulates a positive causal relationship between uncertainty and information seeking behavior, is probably chiefly relevant to explanations of communication behavior during the entry phase. The relationship specified is not a reciprocal one, i.e., information seeking behavior per se is not theorized to bear on uncertainty levels. Since this type of

one-way causality provides little expectation that information seeking behavior will explain a significant amount of the outcome variance in a relationship (liking and satisfaction), and further, since information seeking behavior can probably be adequately subsumed under the construct of increased verbal communication, Berger and Calabrese's third axiom has been omitted from the personal phase model.

In lieu of an axiomatic relationship between uncertainty and information seeking behavior, we can add a new axiom to the model which will help predict levels of attributional uncertainty. While we concluded earlier that a volitional repetition of an interaction signaled a shift from acquaintance to personal phase interactions, we must also be prepared to accommodate interactions brought about by chance meetings, forced proximity due to employment or habitation situations, as well as other tyypes of repeated interactions not specifically initiated by choice. Festinger, Schachter, and Back's (1950) study of the Westgate housing project strongly suggests a relationship between proximity and friendship formation. Zajonc's (1968) work on the attitudinal effects of expsoure provides further support for this notion of enhanced affect resulting from mere exposure to a stimulus object.

However, while both of these studies are adequate in their delivery of predictive power with respect to the impact of proximity or exposure on positive affect, neither provides a truly satisfactory explanation of the processes by which these effects occur. It is not entirely unreasonable to interpret these phenomena in light of our discussion, and suggest that the effects of proximity and exposure are mediated by an intervening mechanism of attributional certainty,

noting that mere exposure to others will provide an enlarged source of information about those others from which more confident retroactive explanations and proactive predictions can be generated. It is also probable that the relationship between exposure time and uncertainty is reciprocal, since reduced uncertainty may well induce interactants to increasingly seek out by choice each other's company. Hence, we can propose:

AXIOM #3: Increases in the amount of total interaction time will produce decreases in the level of uncertainty interactants experience about each other. Decreases in interaction time will produce increases in uncertainty. Further, reductions in uncertainty will produce increases in total interaction time, while increased uncertainty will cause decreases in total interaction time.

As mentioned earlier, it is critical to note that interaction time need not be voluntary, as even compliant time spent in the company of another will provide some quantity of information for inference about that other individual. Conversely, we can consider the increased uncertainty a husband and wife might experience after a forced prolonged separation, such as might be precipitated by military service, extended business trips, and so forth. It is further useful to note our rather broad inclusions under the term interaction time, as this construct is distinguishable from amount of verbal communication by the fact that verbal interaction is not a criterion. In fact, independent coaction within the same room or area can be expected to provide some diminishment of uncertainty sufficient to allow us to subsume this type of activity under the term interaction time.

As originally specified in the initial interaction model, Berger and Calabrese's fourth axiom stipulates only a unidirectional causal relationship between uncertainty and intimacy level of

communication. However, it could be argued that, just as increased verbal communication, nonverbal affiliative expressiveness, and total interaction time, exert a reflexive reduction of uncertainty level, so will increases in the intimacy of communication content reciprocally reduce uncertainty levels such that:

AXIOM #4: High levels of uncertainty in a relationship cause decreases in the intimacy level of communication content; low levels of uncertainty produce high levels of intimacy. Further, as the level of intimacy of communication content increases, uncertainty will decrease.

This reciprocal effect of intimacy level acting upon uncertainty, probably applies to an interactant regardless of whether the degree of intimacy measure is applied to communication content offered by the interactant or his dyadic partner. That is, while we might expect intimate content communicated by a dyadic other to reduce the uncertainty of an interactant, it is also probable that intimate communication offered by an interactant will cause him to undergo a process of self perception or attribution (Bem, 1967) so that he will infer, on the basis of his own communication behavior, a more certain evaluation of his dyad partner. Berger and Calabrese provide the arguments for the reduction of an interactant's uncertainty through intimate communication offered by his dyadic partner -- the more intimate the level of communication, the more information an individual has to process to make confident predictions and explanations of his partner's behavior.

As was the case with their theorized relatioship between uncertainty and information seeking behavior, Berger and Calabrese's fifth axiom, which posits a unidirectional positive causal relationship between uncertainty and reciprocity rate, specifies a dead-end relationship from which we can expect a miniscule amount of outcome

variance to be explained. This structural difficulty, coupled with their explanation of the relationship in terms of knowledge power as it pertains to initial interaction situations, has led to the deletion of this axiom from the personal phase model.

If our assumption of a continual process of attempting to predict and explain others' behavior is correct, we may conclude that for any other individual, a person comes to establish a set of predicted behaviors for that co-interactant. When behavior runs contrary to these expectations, we may consider that an individual has deviated from a set of developed expectations. While such behavior might really be perfectly consistent for the individual involved, it is, nonetheless, deviant from that set of expectations which is attributed to the individual, and which governs the attributor's behavior toward him. Thus in a real sense to the observer, any behavior deviating from a set of expectations about another constitutes perceived deviation and calls into question the observer's entire set of assumptions, acting to increase his uncertainty level both about the other individual and his own ability to accurately predict and explain that other individual's behavior across a range of areas, such that:

AXIOM #5: Deviation from a set of expectations developed about an individual by a co-interactant produces increases in the co-interactant's level of uncertainty about the individual; decreases in perceived deviation produce decreases in uncertainty level.

As was stipulated earlier in the discussion of an optimal level of uncertainty or predictive and explanatory ability, the toleration of uncertainty, in this case created by deviations, may be expected to vary across individuals as a function of other idiosyncratic personal attributes, i.e., some persons may actually welcome

occasional minor deviations, whereas other individuals may find such uncertainty-producing behavior intolerable.

An important change in the conceptualization of a construct, necessitated by the transition from the entry to the personal phase, may be anticipated in the postulated effects of perceived similarities -- theorized by Berger and Calabrese to act negatively on an interactant's level of uncertainty. With the passage of time, some similarities which helped reduce uncertainty during the entry phase, will, during the course of the personal phase, no longer be of sufficient salience to diminish uncertainty. For instance, where, in an initial interaction situation, finding that someone is from the same large city as one's self may be an attribute of sufficient similarity to allow certain rather generalized characteristics to be inferred, in the course of subsequent interactions, more salient similar personal attributes may be required to reduce uncertainty. Thus we can restate:

AXIOM #6: As perceived similarities, coupled with the salience of the attributes perceived as similar, increase, uncertainty will tend to decrease. Decreases in perceived salient similarities will produce increases in uncertainty levels.

The emphasis placed on interactants' perception of similarity in the delineation of this construct is also critical, since the attributions formulated by interactants, regardless of the degree of isomorphism to any specified or absolute reality, guide behavior.

Since there is no basis for believing that the effects of Berger and Calabrese's postulation of the effects of uncertainty on liking will diminish over time, this construct and its axiomatic relationships have been retained in the personal phase model:

AXIOM #8: Decreases in uncertainty level will cause increases in liking; increases in uncertainty produce decreases in liking.

In considering the negative relationship between uncertainty and

liking, it is important to recall that Berger and Calabrese have discussed possibilities other than a strict linear function. Further, in his exhaustive treatment of the effects of exposure upon attitudinal affect, Zajonc (1968) hints at the probable non-linear function which is described by these two constructs. Noting the popular advertising adage warning against overexposure, he hypothesizes that there may be a satiation level at the upper end of the exposure continuum. Subsequent work on the problem of establishing the limiting conditions of the positive relationship between exposure and positive attitudes (Zajonc, Swap, Harrison & Roberts, 1971) has produced the notion that there exists a family of curves appropriate to describe the relationship between frequency of stimulus exposure and perceived favorability of that stimulus, with stimulus discriminability as a possible parameter. Despite the questionable generalizability of his research, in which stimuli tended to be such inanimate objects as paintings, Chinese ideographs, nonsense words, etc., rather than live actors in soial interaction settings, his findings may lead us to suppose that the function between uncertainty and liking describes an almost linear relationship, with some modification at the extreme lower boundary of uncertainty. If an individual can generate completely confident causal attributions and behavioral predictions about another, then it is likely that, rather than a linearly increasing affect for that other, he will experience utter boredom, and hence a drop-off in interpersonal attraction. The anticipated relationship between uncertainty and liking might best be described as a highly positively skewed inverted U.

It may prove useful, in extending the model to the personal phase, to propose an additional axiom capable of predicting some outcome

other than simple affect for a dyadic partner. It is, in fact, highly likely that uncertainty reduction, through the development of an optimal level of predictive and explanatory ability, will generate consequences other than a simple affective response toward a co-interactant. We can, for example, focus on an interactant's attitudinal response or level of satisfaction as it pertains to the actual dyadic relationship, rather than examining exclusively an outcome variable such as liking, which deals only with affect toward the other object individual. This proposed relationship allows the advantage of distinguishing between outcomes, such that it becomes possible to conceptualize situations in which one or both interactants hold high positive affect for the other, but find the relationship relatively unsatisfactory, or the converse situation. Hence, we can propose that:

AXIOM #8: Increases in uncertainty will produce decreases in level of satisfaction with the relationship between interactants. Decreases in uncertainty will cause interactants to experience greater satisfaction with their relationship.

As was the case with Axiom #7, where extremely low uncertainty was hypothesized to cause boredome and a consequent drop-off in liking, we should note that this is not anticipated to be a strictly linear negative function, but rather a highly positively skewed inverted U.

While we have anticipated a strong relationship between uncertainty reduction and satisfaction with a relationship, it seems also highly probable that satisfaction with a relationship will be significantly impacted over time by liking or affective response to the partner. For example, it would seem improbable that an interactant would, for any lengthy period of time, be able to maintain a high

degree of positive affect toward a dyadic partner while experiencing a low level of satisfaction with a relationship, or conversely, a low level of liking coupled with a high degree of satisfaction with a relationship. Hence, we can offer, in addition to the direct effects hypothesized to exist between uncertainty reduction and satisfaction, an indirect relationship through the mediating effects of liking, such that:

AXIOM #9: As liking for a co-interactant increases, an individual's level of satisfaction with his relationship to that co-interactant will increase; decreases in liking will produce decreased satisfaction with a relationship.

Taking all nine axiomatic relationships specified in the personal phase theory, we obtain the theoretical system represented by the e schematic diagram illustrated in Figure II.

Figure II about here

Using procedures suggested by Blalock (1969), we can deduce from these nine axiomatic relationships the 27 theorems illustrated in Figure III.

Figure III about here

METHODOLOGY

While it might be argued that the theory might best have been tested longitudinally, the cross-sectional survey approach used in the study may be seen as valuable, since, at this stage in the development of the theoretical model, we cannot be certain of the exact time

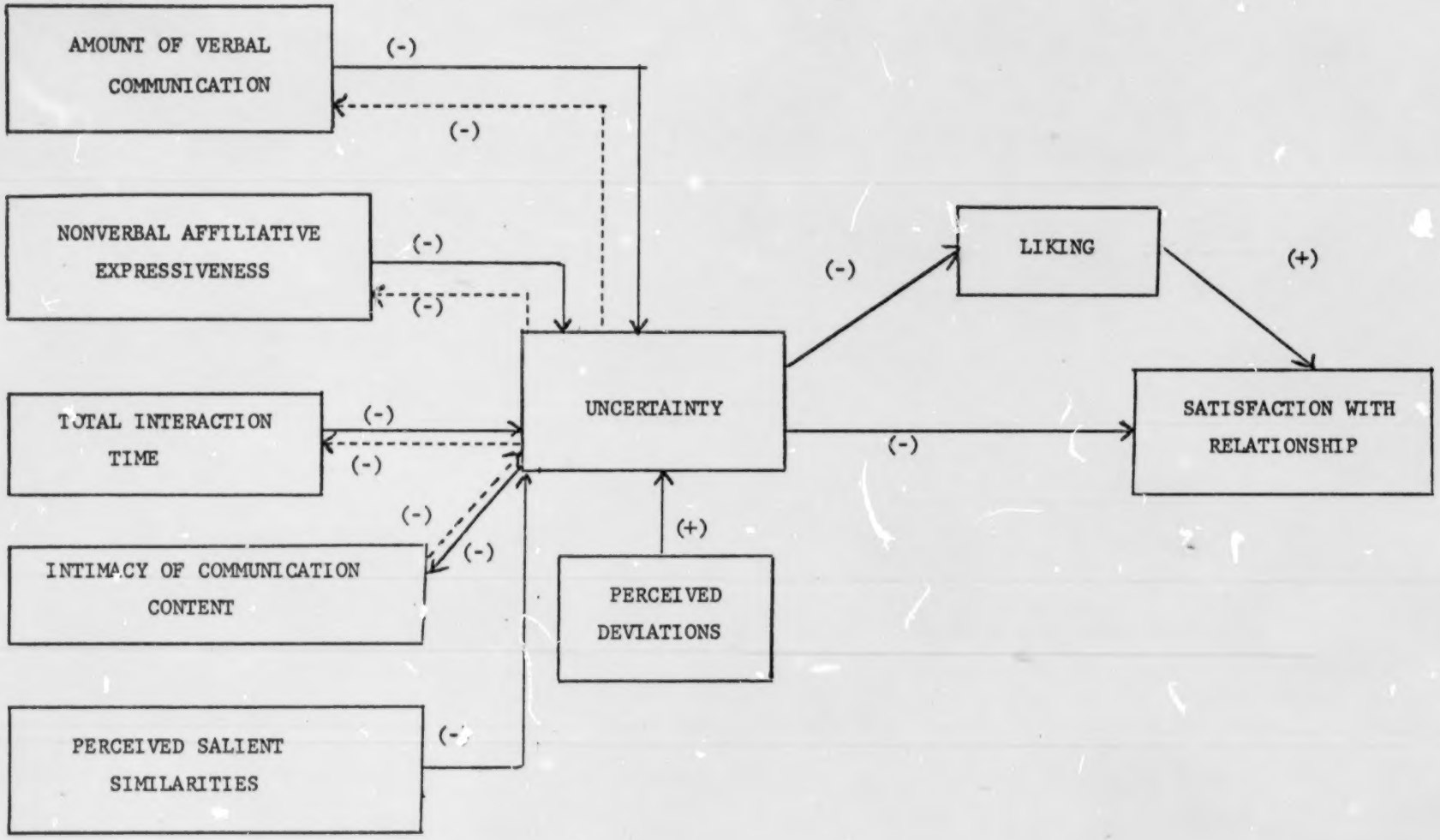
AMOUNT OF VERBAL COMMUNICATION
NONVERBAL AFFILIATIVE EXPRESSIVENESS
TOTAL INTERACTION TIME
INTIMACY OF COMMUNICATION CONTENT
PERCEIVED SALIENT SIMILARITIES
UNCERTAINTY
PERCEIVED DEVIATIONS
LIKING
SATISFACTION WITH RELATIONSHIP
(-)
(-)
(-)
(-)
(-)
(-)
(-)
(-)
(-)
(-)
(+)
(+)

Figure II.

	Total Time Yesterday	Conversatn Time Yest.	Total Recnt Intimacy	Nonverbal Affiliatn	Total Salnt Similarity	Deviations	CLUES	Subject Liking	Satisfctn Now	
Total Time Yesterday										
Conversatn Time Yest.	+									
Total Recnt Intimacy	+	+								
Nonverbal Affiliatn	+	+	+							
Total Salnt Similarity	+	+	+	+						
Deviations	−	−	−	−	−					
CLUES	⊕	⊕	⊕	⊕	⊕	⊖				
Subject Liking	+	+	+	+	+	−	⊕			
Satisfctn Now	+	+	+	+	+	−	⊕	⊕		

○ ---- Indicates Axiom-Specified Relationship

Figure III. Anticipated Relationships

lags likely to exist between any of the specified axiomatic effects, nor are we assured that the lag times which might exist between any set of construct pairs are uniform. Additionally, a cross-sectional analysis tends to reduce the possible introduction of spurious effects due to history, maturation, testing, experimental mortality, and multiple treatment interference (Campbell & Stanley, 1966), effects to which this research content area seems particularly susceptible.

The subject population for the study was comprised of 56 individuals (28 dyads) recruited primarily from a pool of employees at an experimental medical research clinic and a first-year student population in a graduate school of business. Subjects in all cases were cohabiting heterosexual dyads, including 22 married and 6 unmarried conjugal couples. Cohabitation time for subject dyads, who ranged in age from 22 years to 65 years, and averaged 33 years old, ranged from 2 months to 40 years. Most respondents had joint incomes ranging from $20,001 to $40,000; and the mean number of years of formal education completed was 17.

One problem which emerged during subject recruitment and which warrants some attention is the problem of differential refusal rates. Frequently when potential subjects perceived that their relationship was less than idyllic or was undergoing a temporary period of even slight friction, they were reluctant to agree to participation, citing the potential for the questionnaire to further aggravate discontinuities in the relationship. As a result of this leeriness of potential subjects experiencing some dissatisfactions with their relationships to participate, the distributions of the dependent variables of affect for dyadic partner and satisfaction with the relationship are both highly skewed in a negative direction, further

complicating the analysis by providing very little variance to be explained. However, the net effect of this differential refusal rate may be seen as merely promoting a conservative bias, since, where significant amounts of outcome variance can be explained under these constrained conditions, the results would likely only be enhanced by the addition of increased variance in the dependent variables.

A third major feature of the study design which merits some discussion from a methodological standpoint is the total reliance upon pencil and paper self-report measures. While this approach is likely to cause behavioral fanatics to cringe, it is, nonetheless, not entirely unsuited to the phenomenological nature of the proposed theory, since the cognitive porocessing focus of the model stresses the actors' perceptions of both exogenous and endogenous variables, e.g., it is an individual's perception of his similarity to his partner or the intimacy of topics discussed which is theorized to affect his own uncertainty level and ultimately impact his liking for his partner.

This notion of the importance of each actor's perception also accounts for the choice of the individual as the unit of analysis, as opposed to some other alternatives, e.g., analyzing the data by dyads, which might have been a more appropriate choice had an interpersonal accuracy model been derived from a set of congruency hypotheses. The emphasis on each respondent's perception also accounts for the nature and phrasing of particular items contained within the 13-page survey instrument itself.

To achieve a score for total perceived salient similarity, each of fifty items appears three times within the body of the questionnaire, with the order of the items in each of the three scales randomly rotated

to discourage cross-referencing of responses. The formula used to determine a total weighted similarity score numbers each of the items from one to fifty, subtracts the difference between a respondent's estimation of his own and his partner's possession of each attribute from 10, and multiplies the remainder times the salience score for that item. The weighted similarity scores for all fifty items are then summed to produce a total score for similarity of salient attributes.

Measurement of total interaction time and total verbal communication (approximate duration on a daily basis) was estimated both for an "average" day and for the day immediately preceding completion of the qestionnaire. Estimates of the incidence of nonverbal expressions of affilitation were sampled only for the previous day.

The degree of intimacy of topics discussed by partners was determined by fifteen conversation topics, derived chiefly from Altman and Taylor's (1973) work in social penetration. Subjects were asked if they had ever discussed each of the topics and which of the topics they had discussed within the last six months. The addition of a recency component allows us some discrimination between accelerating or stable relationships and potentially disintegrating ones where intimate topics may have been discussed at one time, but the degree of intimacy of conversation has since dropped off.

The final construct theorized to impact interactants' levels of uncertainty is deviation from a set of developed behavioral expectations. This concept has been operationalized simply in terms of surprise, with each respondent requested to estimate the number of times during the previous week that his partner said or did something, either positive or negative, which elicited surprise in the respondent.

One of the major difficulties posed both by the original Berger-Calabrese model and the currently proposed personal phase theory is the relative difficulty of observing and measuring an intervening internal construct of the nature of the central concept Uncertainty. Clatterbuck (1976) has recently developed a scale designed to tap the uncertainty one interactant feels toward another in initial dyadic interaction situations, based primarily on Altman & Taylor's (1973) interpersonal penetration work. In the Clatterbuck Uncertainty Evaluation Scale (CLUES), respondents are posed a series of questions about the other interactant and asked to provide a percentage figure representing the amount of confidence they have in their internal responses to each question. Because the results of a pilot study of personal phase interactions using one of the original versions of CLUES yielded certainty scores which were highly skewed in a negative direction, the scale was revised to increase the proportion of intimate items. (With possible scores ranging from 0 to 100, the mean was 78, median = 80, variance = 95.7, range = 46, and skewness = -1.35. Only one subject had a composite score of less than 50.)

Additionally, the scale format was revised to employ a seven-point response scale, ranging from Absolutely Uncertain to Absolutely Certain, in an effort to reduce the likelihood of subjects using separate probability models to calculate their certainty about questions with different numbers of alternatives and varying degrees of specificity of internal response.

Measurement of subjects' affect for their dyadic partners was obtained by a simple nine-point response scale to the question "How much do you like your partner?". A similar measure was used to tap each subject's estimation of how much his partner liked him.

present time, how satisfied are you with your relationship with your partner?" In addition to an estimation of level of satisfaction with the relationship at the time the questionnaire was completed, each subject was asked to retroactively graph his level of satisfaction with the relationship for each year he and his partner had cohabited. This rather unusual retroactive graphing procedure had the advantage of providing trend information, even within the constraints of a cross-sectional analysis. Additional variables indicating growth, recession, or stability from the relationship's inception and an index to the slope of satisfaction over the last three years were easily obtainable and codifiable from the graphs.

RESULTS AND DISCUSSION

In considering the results generated by this study it should be emphasized from the outset that what has really been tested is a subset of the causal model specified in the theoretical section of this paper. Although the time-ordered reflexive inter-construct relationships specified in Axioms 1, 2, 3 and 4 define the theory as non-recursive, the cross-sectional approach used here coupled with multiple regression analysis is capable at best of analyzing only the type of recursive relationships specified in Figure V. Hence, the reciprocal time-delayed causal links hypothesized to return from Uncertainty to Amount of Verbal Communication, Nonverbal Affiliative Expressiveness, Total Recent Intimacy, and Total Interaction Time have not been tested within this body of research. Rather, it has been assumed that, because of the theorized cyclical nature of these relationships, it is possible to use cross-sectional measurement and data analysis to examine the short-term effects of the exogenous variables upon Uncertainty,

and, in turn, the impact of Uncertainty level upon the outcome variables Liking and Level of Satisfaction with the Relationship.

Bearing in mind this qualification of the study as a partial test of the complete theoretical system, we can examine the empirical results of the survey and consider the scoreboard of evidence for the theory. Figure III contains a summary chart of the positive and negative directionality anticipated in the nine axioms and twenty-seven theorems which constitute the theory. Comparing the Pearson Correlation coefficients contained in the upper diagonal of Figure IV to the non-axiomatic relationships shown in Figure III, it can be observed that of the twenty-seven theorem-specified relationships, 19 of the correlations are in the predicted direction, while only 8 are not. Further, if we consider only those correlation coefficients which are significant beyond the .05 level of probability, we find that of the 9 significant correlations, 8 have been correctly predicted.

Figure IV about here

It is important to note that all 9 correlations which occur in opposition to their predicted directions involve as one of the variables in the pair associations either Total Recent Intimacy or Total Perceived Salient Similarity. Hence, in attempting to delimit plausible explanations for these failures in prediction, it is not unreasonable to assume that the underlying causes reside in some facet of the operationalization or measurement of these two variables, rather than any fault within the theoretical model. Further support for this position may be found in the relatively strong correlations between Intimacy and Similarity and the variables with which they are directly asso-

Figure IV
CORRELATIONS

Upper Diagonal = Zero Order Partials
Lower Diagonal = First Order Partials, Controlling for CLUES

□ = Axiomatic Relationships

	Total Interaction Time Yesterday	Conversation Time Yesterday	Nonverbal Affiliative Expressiveness	Total Recent Intimacy	Total Salient Similarity	Perceived Deviations	CLUES (Attributional certainty)	Subject Liking for Partner	Satisfaction with the Relationship
Total Interaction Time Yesterday		.632	.359	-.009	-.067	-.337	.325	.162	.312
		(.001)	(.008)	(.477)	(.333)	(.012)	(.015)	(.144)	(.018)
Conversation Time Yesterday	.594		.261	.061	-.009	-.112	.292	.184	.435
	(.001)		(.041)	(.346)	(.477)	(.232)	(.026)	(.113)	(.001)
Nonverbal Affiliative Expressiveness	.282	.184		.116	-.153	-.048	.327	.185	.402
	(.032)	(.116)		(.224)	(.158)	(.378)	(.014)	(.112)	(.003)
Total Recent Intimacy	-.088	-.005	.047		.072	.251	.223	.093	-.048
	(.285)	(.488)	(.382)		(.318)	(.048)	(.071)	(.272)	(.378)
Total Salient Similarity	-.198	-.119	-.296	-.003		-.188	.338	-.138	-.055
	(.099)	(.220)	(.026)	(.492)		(.108)	(.012)	(.183)	(.359)
Perceived Deviations	-.265	-.027	.057	.342	-.097		-.301	-.178	-.345
	(.041)	(.432)	(.357)	(.012)	(.266)		(.022)	(.121)	(.010)
CLUES (Attributional Certainty)								.309	.390
								(.019)	(.004)
Subject Liking for Partner	.069	.103	.094	.026	-.271	-.094			.646
	(.329)	(.253)	(.273)	(.434)	(.038)	(.272)			(.001)
Satisfactions with the Relationship	.214	.364	.315	-.150	-.216	-.260		.600	
	(.082)	(.008)	(.019)	(.166)	(.080)	(.044)		(.001)	

ciated in axiomatic relationships.

The first of two possible explanations concerns itself with the problems associated with restricted range of distribution. While nearly every other variable generated a standard deviation comprising at least 10% of its possible range, the standard deviation for Similarity represents only 7% of its theoretic range of scores. Similarly, Total Recent Intimacy of communication topics suffers from a problem associated with restricted range of distribution, although in this case, the problem can be more specifically defined as one resulting from a ceiling effect. With scores ranging from a possible minimum of 15 to a maximum of 30, we find that the mode is 30, with 13 of 53 valid cases reporting that score. This distribution, with a skewness of -0.95, coupled with an intuitive scrutinization of the items contained in the scale, would suggest that the Intimacy scale used suffers from the same problem of weighting toward non-intimate items that plagued the adaptation of the original CLUES instrument from initial to personal phase research.

A second apparent problem concerns differential time lags between actual behaviors and their measurement. Of the six exogenous variables theorized to predict the level of Uncertainty any iteractant may experience, four were operationalized in terms of very recent behavior: Conversation Time, Total Interaction Time, and Nonverbal Expressions of Affiliation were each measured on the basis of reported activity occurring on the day immediately preceding measurement. While these measures were originally selected over estimated averages of daily behavior in light of the notion that immediacy in recall should provide more accurate report measures than averaged estimates, the fact that of these three variables, two correlate more strongly with CLUES

than the averaged estimates suggests that the variables may impact Uncertainty level almost immediately.

Similarly, Perceived Deviation, which is theorized to impact Uncertainty with a relatively short time lag was measured by reported behavior within the week immediately preceding measurement. However, the Total Recent Intimacy scale requested that any conversation topics which had been discussed within the last six months be included in the reported behavior. Just as this time framework subsumes behavior occurring over a relatively long period of time, so can we assume that the perception of Total Salient Similarity depends upon behaviors which may easily have occurred much earlier than the other behaviors and attitudes being sampled. Hence, in predicting associations between Total Recent Intimacy and Total Salient Similarity and other peripheral constructs, it should not be surprising to find less than complete success, since we are isolating variables at different points in time, despite the use of a cross-sectional approach.

Since only 8 of the 19 correctly predicted correlations generated by the twenty-seven theorems are significant beyond a probability level of .05, the problems associated with multicolinearity, which might otherwise be anticipated in regressing the dependent variables indirectly through CLUES on the six exogenous variables, are greatly reduced. This threat is further diminished by the observation that of the 8 significant correlations, 4 occur between exogenous and endogenous variable pairs, leaving only 4 significant correlations of the 15 possible between the six exogenous variables.

Having thus been assured that the theoretical model predicts reasonably well the twenty-seven theorem-specified relationships, we can consider the more important nine axiomatic relationships.

The simple associations between variable pairs related by axiomatic propositions have all been correctly predicted by the theory, as indicated by the information contained in Figures III and IV. Further, of the 9 correlation coefficients reported for axiomatic relationships, 8 are significant beyond the .05 level of probability. The single correlation which does not achieve significance, a coefficient of .223 with p=.07, involves the association between CLUES and Total Recent Intimacy, which, as has already been indicated, may involve behavior spanning a period of time too distant from the single point of measurement.

Using all of the six exogenous variables theorized to predict Uncertainty level in a multiple regression analysis, we can account for more than 38% of the variance in CLUES. With each of the independent variables entered stepwise into the equation, the analysis yields the coefficients shown in Table I.

Table I about here

Regressing Subject Liking for partner on CLUES enables us to account for almost 10% of the variance in Subject Liking, as shown in Table II.

Table II about here

Finally, if we regress Satisfaction with the Relationship on CLUES and Subject Liking for partner, entering the variables hierarchically into the equation, we can predict over 45% of the variance of Satisfaction, and obtain the coefficients shown in Table III.

Table I.

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R	B
Similarity	0.3378	0.1141	0.1141	0.3378	0.9149338
Nonverbal	0.5108	0.2609	0.1468	0.3272	0.2071539
Time Ystrdy	0.5592	0.3127	0.0518	0.3252	0.1476382
Intimacy	0.5825	0.3393	0.0266	0.2229	0.4958177
Deviate	0.6144	0.3775	0.0382	-0.3011	-0.4479943
Conversatn	0.6218	0.3867	0.0092	0.2917	0.5299912
(CONSTANT)					1.708

Table II.

(Dependent Var = Subject Liking)

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R	B
CLUES	0.3089	0.0954	0.0954	0.3089	0.4464187

Table III.

(Dependent Var = Satisfaction w/Relationship

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R	B
CLUES	0.3897	0.1519	0.1519	0.3897	0.4162183
SubjLiking	0.6761	0.4571	0.3052	0.6458	0.7953536

Table III about here

The structural coefficients for all pairs of variables associated in axiomatic relationships are presented in Figure V. Although more sensitive to fluctuations in sampling variance, standardized beta coefficients have also been reported in Figure VI. The model was subjected to an additional test, performed by partialling out the effects of CLUES from inter-construct correlations, with the results presented in Figure IV.

Figures V and VI about here

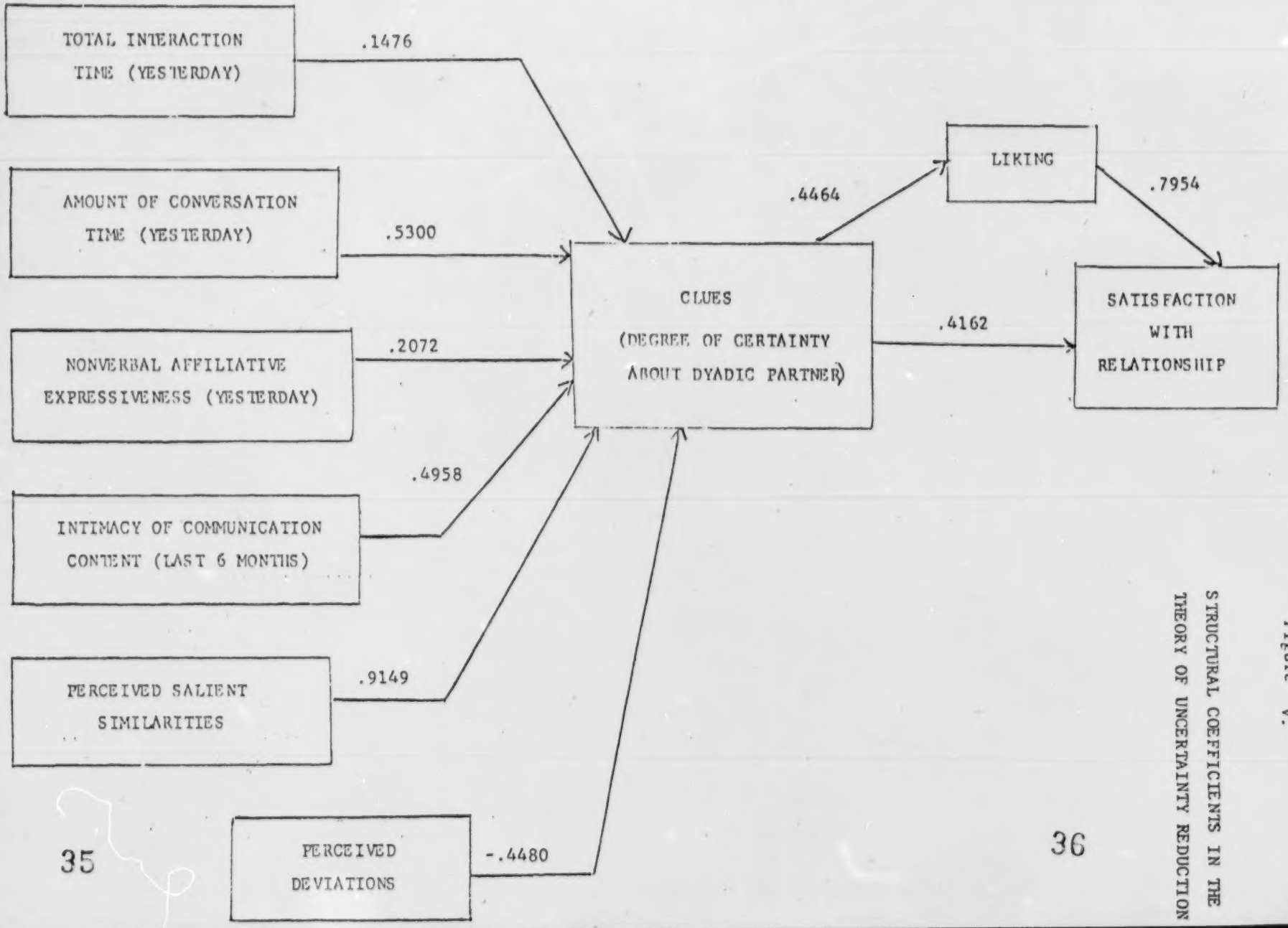

Figure V. STRUCTURAL COEFFICIENTS IN THE THEORY OF UNCERTAINTY REDUCTION

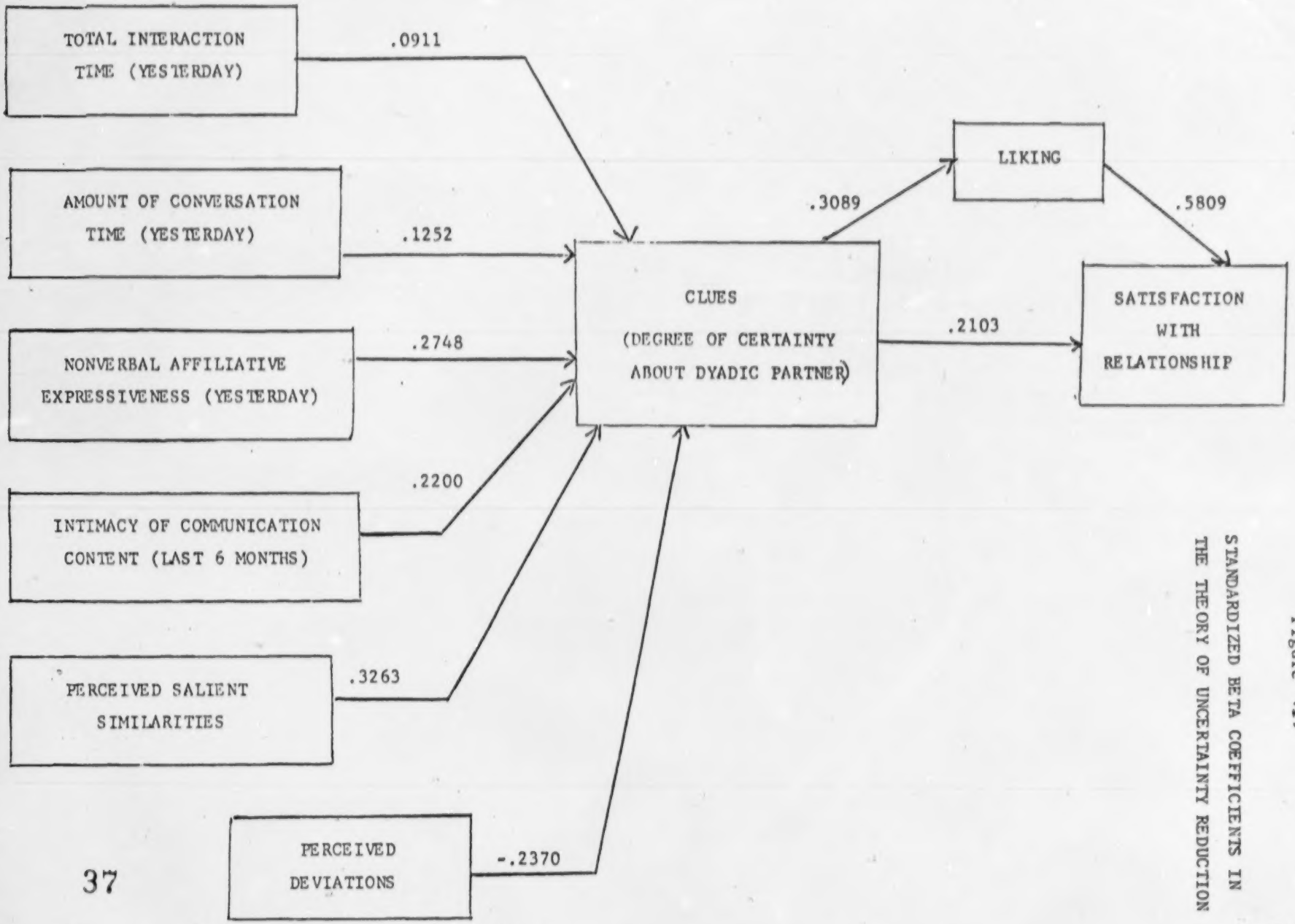

Figure VI.

STANDARDIZED BETA COEFFICIENTS IN THE THEORY OF UNCERTAINTY REDUCTION

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